AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for reducing detrimental phenomena related to disturb voltages in a data storage apparatus employing passive matrix-addressing, ~~particularly a memory device or a sensor device,~~ wherein the data storage apparatus comprises a plurality of data storage cells for storing logical values as given by a specific charge value set in each cell, wherein each of the data storage cells comprises an electrically polarizable memory material exhibiting hysteresis, ~~particularly a ferroelectric or electret material,~~ wherein the cells are physically disposed in one or more matrices, ~~wherein~~ each of said matrices providing passive matrix addressability to the cells, ~~wherein~~ and each of the matrices comprising a first and a second electrode set, ~~wherein~~ the electrodes of each set ~~are~~ provided in parallel, one set of electrodes forming word lines and the other set forming bit lines, wherein the word line electrodes and the bit line electrodes are provided crossing each other and in direct or indirect contact with the memory material, ~~wherein~~ the data storage cells of the apparatus ~~are~~ realized as capacitor-like elements defined in a volume of the memory material between or at the crossings of word lines and bit lines and ~~can be~~ settable to either of at least two polarization states ~~or switched therebetween~~ by applying an active voltage pulse of a voltage V_S larger than ~~the~~ a coercive voltage V_C corresponding to ~~the~~ a coercive electric field of the memory material, between a word line and a bit line and over the data storage cell defined therebetween, wherein an application of electric potentials conforms to an addressing operation, and wherein the electric potentials applied to all word and bit lines in the addressing operation are controlled in a time-coordinated manner according to a predetermined voltage pulse protocol, wherein the data storage cells of the data storage apparatus are provided in two or more electrically separated segments, each segment comprising a separate physical address space of the data storage apparatus, ~~wherein~~ the method comprising:

~~a first addressing operation comprises~~ setting in a first addressing operation constituting a first part of an addressing cycle one or more addressed data storage cells in one of the segments to a first polarization state by means of a first active voltage pulse in the first addressing operation, during which each bit line dependent on the voltage pulse protocol can be connected with a sensing means for detecting the polarization state of the data storage cell at least under a part of the duration of the first active voltage pulse;

applying to the one or more addressed data storage cells in the one segment dependent on the voltage pulse protocol a second voltage pulse which can be a second active voltage pulse of opposite polarity to that of the first active voltage pulse and switching the addressed data storage cell from the first polarization state to a second polarization state, such that ~~the~~ each cell being addressed is set to a predetermined polarization state as specified by the first addressing operation;, ~~characterized by further~~

applying in ~~the~~ a second addressing operation the second voltage pulse to one or more data storage cells in another segment, such that ~~the cell or~~ one or more data storage cells in the

another segment are preset to either the first polarization state or the second polarization state; and

dependent on the addressing operation to be carried out, storing information in said one ~~of the~~ or more preset data storage cells in ~~the~~ said another segment after an active voltage pulse with the same polarity has been applied thereto~~;~~, said another segment being selected for the second addressing operation on the basis of prior and/or scheduled application of active voltage pulses to said two or more electrically separated segments.

2. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ storing information on the pre-set polarization state with reference to the physical address of the cell.

3. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ retrieving the stored information on the polarization state prior to subjecting a cell to the second voltage pulse.

4. (Currently amended) ~~A~~ The method according to claim 3, wherein ~~characterized by applying~~ the optional second active voltage pulse is applied with opposite polarity to the first active voltage pulse if the pre-set polarization corresponds to the first polarization state, and

~~applying~~ the optional second active voltage pulse is applied with same polarity as the first active voltage pulse if the pre-set polarization corresponds to the second polarization state.

5. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ removing the stored information on the cell being pre-set to a polarization state after subjecting each of the pre-set cells at the address to the second voltage pulse.

6. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ storing information on the total number of pre-set cells.

7. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ directing data in an addressing operation to the segment with the longest time since last being subjected to an active voltage pulse.

8. (Currently amended) ~~A~~ The method according to claim 7, further comprising: ~~characterized by~~ using a queue;

putting a reference to the segment most recently subjected to an active voltage pulse last in the queue; and

retrieving a reference to the segment with the longest time since being subjected to an active pulse from a first position in the queue.

9. (Currently amended) ~~A~~ The method according to claim ~~10~~ 8, further comprising: ~~characterized by~~ storing references to each of the segments in a "segment table" with additional information connected to each of the references.

10. (Currently amended) ~~A~~ The method according to claim 9, wherein ~~characterized by~~ the additional information ~~being~~ comprises at least one of number of addresses with pre-set cells in the referenced segment, ~~and/or~~ timestamp of last segment access, ~~and/or~~ lock state mark, ~~and/or~~ physical addresses to pre-set cells in the referenced segment, and ~~/or~~ a pre-set polarization state mark connected to each of the physical addresses to pre-set cells.

11. (Currently amended) ~~A~~ The method according to claim 10, further comprising: ~~characterized by~~ removing the physical address of ~~the~~ each cell subjected to the second voltage pulse from the segment table.

12. (Currently amended) ~~A~~ The method according to claim 10, further comprising: ~~characterized by~~ adding the physical address of ~~the~~ each cell subjected to the first active voltage pulse to the segment table.

13. (Currently amended) ~~A~~ The method according to claim 10, further comprising: ~~characterized by~~ setting the lock state mark of a segment reference in the segment table when the first active voltage pulse or the second voltage pulse is applied to a cell in the segment corresponding to the segment reference.

14. (Currently amended) ~~A~~ The method according to claim 10, further comprising: ~~characterized by~~ updating the timestamp of last segment access of a segment reference in the segment table when the first active voltage pulse or the second voltage pulse is applied to a cell in the segment corresponding to the segment reference.

15. (Currently amended) ~~A~~ The method according to claim 10, further comprising: ~~characterized by~~ unsetting the lock state mark of a segment reference in the segment table when the difference between current time and the timestamp of last segment access for the segment reference exceeds a predetermined value.

16. (Currently amended) ~~A~~ The method according to claim 10, wherein ~~characterized by waiting to apply~~ the first active voltage pulse is not applied until the lock state mark of the segment to be subjected to the first active voltage pulse has been unset, and ~~/or waiting to apply~~ the second voltage pulse is not applied until the lock state mark of the segment to be subjected to the second voltage pulse has been unset.

17. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ storing the physical address of ~~the~~ each cell subjected to the second voltage pulse with reference to ~~the~~ a logical address of the addressing operation.

18. (Currently amended) ~~A~~ The method according to claim 17, wherein ~~characterized by storing~~ the physical address is stored with reference to the logical address in an

"address mapping table" with ~~optional~~ address level information connected to each of the physical address entries in the address mapping table.

19. (Currently amended) ~~A~~ The method according to claim 18, wherein ~~characterized by~~ the address level information ~~being~~ is at least one of a pre-set mark, ~~and/or~~ a pre-set polarization state mark, and/~~or~~ a segment reference.

20. (Currently amended) ~~A~~ The method according to claim 18, wherein ~~characterized by storing~~ the address mapping table is stored in a fast access memory other than the data storage apparatus employing passive matrix-addressing.

21. (Currently amended) A method according to claim 18, wherein ~~characterized by not listing~~ a predetermined number of addresses to pre-set cells are not listed in the address mapping table.

22. (Currently amended) ~~A~~ The method according to claim 18, further comprising: ~~characterized by~~ retrieving the physical address with the address level information from the address mapping table before applying the first active voltage pulse ~~and/~~or the second voltage pulse.

23. (Currently amended) ~~A~~ The method according to claim 22, further comprising: ~~characterized by not applying the first active voltage pulse and bringing~~ delaying the second voltage pulse ~~forward in time~~ if finding a set pre-set mark.

24. (Currently amended) ~~A~~ The method according to claim 22, further comprising: ~~characterized by not applying the first active voltage pulse and bringing~~ delaying the second ~~voltage pulse forward in time if the~~ addressing operation ~~is write and~~ if the address of the pre-set cells is listed in the address mapping table.

25. (Currently amended) ~~A~~ The method according to claim 22, further comprising: ~~characterized by not applying the first active voltage pulse and bringing~~ delaying the second ~~voltage pulse forward in time if the~~ addressing operation ~~is write and~~ if the total number of pre-set cell addresses are exceeding a predetermined value.

26. (Currently amended) ~~A~~ The method according to claim 17, further comprising: ~~characterized by~~ storing the logical address in part of the data storage cells at the physical address corresponding to the logical address.

27. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ distributing addresses whereat each cell ~~are~~ is pre-set to the same polarization state among the segments during idle time when no other higher-priority operations are ongoing or imminent in the segments.

28. (Currently amended) ~~A~~ The method according to claim 27, further comprising: ~~characterized by~~ executing a read with write-back operation in the segment with the least number of pre-set cells.

29. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ creating cells that are pre-set to the same polarization state at a free address during idle time when no other higher-priority operations are ongoing or imminent in the segments.

30. (Currently amended) ~~A~~ The method according to claim 29, further comprising: ~~characterized by~~ applying an ~~single polarity~~ active voltage pulse of the same polarity to each cell at the free address.

31. (Currently amended) ~~A~~ The method according to claim 29, wherein ~~characterized by selecting~~ the free address is selected in ~~the~~ a segment with the least number of pre-set cells

32. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ imposing a delay before applying the first active voltage pulse if the second voltage pulse of ~~the~~ a preceding operation, or any of a predetermined number of preceding operations, was applied to the same segment as ~~the~~ a current addressing operation.

33. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ imposing a delay before applying the first active voltage pulse if the difference between current time and the last time the segment was subjected to a first active voltage pulse or a second voltage pulse does not exceed a predetermined value.

34. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ imposing a delay before applying the second active voltage pulse if the difference between current time and the last time the segment was subjected to a first active voltage pulse or a second voltage pulse, does not exceed a predetermined value.

35. (Currently amended) ~~A~~ The method according to claim 1, further comprising: ~~characterized by~~ analyzing the consecutive operation or a predetermined number of consecutive operations before executing the current addressing operation.

36. (Currently amended) ~~A~~ The method according to claim 35, further comprising: ~~characterized by~~ selecting another segment than addressed by the consecutive operation or by a predetermined amount consecutive operations for application of the second voltage pulse of the current addressing operation.